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10/531,102	04/11/2005	Akinori Nishihara	60562.00006	2155

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SQUIRE, SANDERS & DEMPSEY L.L.P.  
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TYSONS CORNER, VA 22182

EXAMINER
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GUILL, RUSSELL L

ART UNIT	PAPER NUMBER
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2123

MAIL DATE	DELIVERY MODE
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02/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/531,102

Applicant(s)

NISHIHARA ET AL.

Examiner

Russ Guill

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date 1/22/2008.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This Office Action is in response to an Amendment filed January 22, 2008. No claims were added or canceled. Claims 1 - 3 are pending. Claims 1 - 3 have been examined. Claims 1 - 3 have been rejected.
2. The Examiner would like to thank the Applicant for the very well-presented amendment, which was useful in the examination process. The Examiner appreciates the effort to carefully consider the Office Action, and make appropriate arguments and amendments.

### *Response to Remarks*

3. Regarding the Information Disclosure Statement:
  - a. The new Information Disclosure Statement dated January 22, 2008, has been considered.
4. Regarding the objection to the specification:
  - a. Applicant's amendment to the specification overcomes the objection.
5. Regarding claim 2 rejected under 35 USC § 112, first paragraph:
  - a. Applicant's arguments have been fully considered, but are not persuasive, as follows.
  - b. The Applicant argues:
    - c. The Office Action rejected claim 2 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Office Action stated that one reasonably skilled in the art could not make or use the invention from the disclosure in the specification, coupled with information known in the art, without undue experimentation because the claim recites in line 14, " $h_{i,j}^{(p)}$ ".

and the meaning of the term does not appear to be described in the specification. (See Office Action at pages 2-3, paragraph 4). This rejection is respectfully traversed for the following reasons.

d. The specification discloses that in a first stage of an embodiment of the invention, the first recurrence is run from  $j = 1$  up to  $j = N - K$ , where  $N$  and  $K$  are previously defined. (see Specification at paragraph 0011). The specification further discloses that, in the embodiment of the invention, the first recurrence is expressed in terms of  $j$ . (see Specification at paragraph 0011). Furthermore, the specification discloses that, in an embodiment of the invention, " $h_1^{(p)} = (h_{i,j}^{(p)}) = (h_{i,0}^{(p)}, h_{i,1}^{(p)}, \dots)$ ," and that " $h_i = h_{i,0}^{(N)}$  where  $0 < i < N$ ." (see Specification at paragraphs 0013, 0051). Therefore, Applicants respectfully submit that one of ordinary skill in the art would understand the meaning of the term " $h_{i,j}^{(p)}$ " and therefore, one of ordinary skill in the art could make or use the invention from the disclosure in the specification, coupled with information known in the art, without undue experimentation. For the above reasons, Applicants respectfully request that the rejection be withdrawn.

i. The Examiner respectfully replies:

ii. While the Examiner appreciates the Applicant's argument, the index  $j$  appears to be undefined in both the specification and the claim 2. Further, the recursion formulas appear to be defined in terms of  $h_i^{(p)}$  so it is unclear how the  $h_{i,j}^{(p)}$  are calculated.

6. Regarding claims 1 - 3 rejected under 35 USC § 112, second paragraph:

a. Applicant's arguments have been fully considered, and are persuasive.

7. Regarding claims 1 - 3 rejected under 35 USC § 101:

a. Applicant's arguments have been fully considered, but are not persuasive, as follows.

**b. The Applicant argues:**

c. The Office Action rejected claims 1-3 under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. Regarding independent claim 1 and dependent claim 2, the Office Action stated that, "the claim appears to be entirely an abstract idea, and as such is non-statutory." The Office Action further stated that, "an ordinary artisan interpreting the claim in light of the specification would reasonably interpret the claims as a set of abstract operations." Finally, the Office Action stated that, "the program does not appear to produce a tangible result to support a practical application, nor produce a physical transformation." (see Office Action at page 4, paragraph 7). Regarding independent claim 3, the Office Action stated that, "the claim is directed to a program, which appears to be functional descriptive material per se, and therefore, the claim is directed to non-statutory material." The Office Action further stated that, "the program does not appear to produce a tangible result to support a practical application." (see Office Action at page 4, paragraph 7).

d. With respect to claims 1 and 2, Applicants respectfully traverse this rejection because claims 1 and 2 do not recite abstract ideas, and the claims do produce a tangible result, namely, "extracting impulse response coefficients of a universal maximally flat FIR filter," as recited in claim 1.

e. The Office Action stated that, with respect to claim 1, "[n]one of the claim limitations appear to expressly or inherently require tangible physical components." (see Office Action at page 4, paragraph 7(a)). Applicants note that the implementation of the claim requires computational resources in the form of hardware capability in order to perform arithmetic operations, and additional hardware resources for storage of the intermediate and final numerical results. Specifically, the specification discloses that the invention "relates to a computational method ... and to a computational program for the same." (see Specification at 0002). Furthermore, the specification describes that a common problem with computations involving binomial coefficients is that they introduce very large

integers to the intermediate steps of the computation, and that there are cases when limitations on hardware and software resources dictate the use of efficient means in computation of filter coefficients, and thus, disclose that embodiments of the invention require tangible physical components, such as hardware resources. (see Specification at 0004). Finally, the specification discloses that an embodiment of the invention is mostly suitable for real-time generation of the coefficients on a DSP chip because it may be easily implemented in a computational environment that has restrictions on the available hardware and software resources. (see Specification at 0074). Given these physical components, the claim transforms an initial sequence of trivial numbers, which is stored in the form of a numerical array embodied on a computer readable medium, to a final sequence of numbers for use in the physical realization of maximally flat FIR digital filters.

i. The Examiner respectfully replies:

ii. First, while the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. The Applicant appears to be reciting features from the specification rather than the claims; for example, "the claim transforms an initial sequence of trivial numbers, which is stored in the form of a numerical array embodied on a computer readable medium", the claim does not appear to recite that the numbers are stored on a computer readable medium.

iii. Second, as recited by the Applicant ("the claim transforms an initial sequence of trivial numbers, . . . to a final sequence of numbers"), the invention appears to transform numbers into numbers, which is manipulation of abstract ideas.

f. The Applicant argues:

g. The Office Action further stated that claim 1 "appears to be entirely an abstract idea, and as such is non-statutory." (see Office Action at page 4, paragraph 7(a)). Applicants respectfully emphasize that the tangible result produced by claim 1 is a finite-length sequences of numbers. The numbers are the exact values of the weighting coefficients that yield maximally flat FIR filter characteristics. When used as weighting coefficients, also known as impulse response coefficients, in an FIR digital filter, a smoothing effect is produced by the action of the coefficients. This filtering effect, which is produced by the steps of the claim, can be used to smooth and process arbitrary digital sequences.

h. Furthermore, the claims enables one to generate, on a computable readable medium using hardware resources, and in a computationally efficient and simple manner, the coefficients described above. These coefficients can be produced for any arbitrarily given filter specifications pertaining to the maximally flat type.

i. Thus, claim 1 produces a tangible result, which is the impulse response coefficients, and supports a practical application, which is smoothing of digital data with a frequency response of a maximally flat type.

i. The Examiner respectfully replies:

ii. First, while the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. The Applicant appears to be reciting features from the specification rather than the claims; for example, "the claims enables one to generate, on a computable readable medium", which does not appear to be recited in the claim.

iii. Second, as recited above, the claim produces impulse response coefficients, which appear to be numbers, which are abstract ideas. Thus, the claim appears to be directed to an abstract idea.

j. The Applicant argues:

k. Applicants respectfully submit that claim 2 depends upon claim 1, and thus, the reasons why claim 1 recites statutory subject matter equally applies to claim 2 as well. Thus, for the reasons discussed above, Applicants submit that claims 1 and 2 are directed to statutory subject matter, and respectfully request that the rejection be withdrawn.

i. The Examiner respectfully replies:

ii. Since the rejection of claim 1 was maintained, the rejection of claim 2 is similarly maintained.

l. The Applicant argues:

m. With respect to claim 3, the Office Action stated that "the claim must produce either a physical transformation or have a practical application having a concrete, useful and tangible result." Applicants respectfully submit that MPEP 2106.01 states that "[w]hen functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized." (see MPEP 2106.01; see also *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031; *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754). Applicants further submit that claim 3 has been amended to recite "a program for computing FIR filter coefficients embodied on a computer readable medium," and that a program for computing FIR filter coefficients embodied on a computer readable medium has the capability of transforming an initial FIR digital filter that can merely receive digital data, but cannot produce useful digital data as its output, to a useful maximally flat digital filter that receives digital data and processes it to produce a smoothed version. Thus, for the reasons discussed above, Applicants respectfully submit that the claim



amendment moots the rejection, and respectfully request that the rejection be withdrawn.

- i. The Examiner respectfully replies:
- ii. Since the program is recorded on a computer readable media, the rejection that the claim is directed to software (an abstract idea) is overcome.
- iii. However, the claim contains abstract ideas that do not appear to produce a useful, concrete, and tangible result to support a practical application. Thus, the rejection is maintained.

8. Regarding claims 1 - 3 rejected under 35 USC § 103:

- a. Applicant's arguments have been fully considered, and are persuasive.

*Claim Objections*

9. Claim 2 is objected to because the claim recites in line 3 that the index  $j$  runs from 1 to  $N$ , but the Applicant appears to have recited in their response that the index should run from 1 to  $N - K$ .

10. Claim 3 is objected to because the claims recites an array  $r$  having  $N^3$  elements, but the indices  $p$ ,  $i$ , and  $j$  appear to run from 0 to  $N$ , which would appear to require  $(N+1)^3$  elements.

*Claim Rejections - 35 USC § 112*

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall

set forth the best mode contemplated by the inventor of carrying out his invention.

- a. **Claim 2** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. One reasonably skilled in the art could not make or use the invention from the disclosure in the specification, coupled with information known in the art, without undue experimentation, for the following reasons:
  - i. Regarding claim 2, the claim recites in line 14, " $h_{ij}(p)$ ". The meaning of the double-subscripted term does not appear to be described in the specification.
- b. Weighing the evidence as a whole, the Examiner concludes that one reasonably skilled in the art could not make or use the invention from the disclosure in the specification, coupled with information known in the art, without undue experimentation.
- c. **Claim 3** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.
  - i. Claim 3 recites a program embodied on a computer readable media. The specification does not appear to recite a computer readable media.

*Claim Rejections - 35 USC § 101*

12. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

13. Claims 1 - 3 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

a. Regarding claim 1 and dependent claim, the claim appears to be entirely an abstract idea, and as such is non-statutory. None of the claim limitations appear to expressly or inherently require tangible physical components. An ordinary artisan interpreting the claim in light of the specification would reasonably interpret the claim as a set of abstract operations. Further, the claim must produce either a physical transformation or have a practical application having a concrete, useful and tangible result. The program does not appear to produce a tangible result to support a practical application, nor produce a physical transformation.

b. Regarding claim 3, the claim is directed to a program embodied on a computer readable medium. The term, "program" can reasonably be interpreted as source code, which is non-functional descriptive material, and thus is non-statutory. If a claim can be interpreted as non-statutory, the claim must be amended to allow only statutory interpretations. Further, the claim must produce either a physical transformation or have a practical application having a concrete, useful and tangible result. The program does not appear to produce a tangible result to support a practical application.

*Allowable Subject Matter*

14. Any indication of allowability is withheld pending resolution of the outstanding rejections.

*Conclusion*

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

16. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russ Guill whose telephone number is 571-272-7955.


The examiner can normally be reached on Monday - Friday 9:30 AM - 6:00 PM.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group Receptionist: 571-272-2100.

19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Russ Guill  
Examiner  
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